During the closing days of the month overcast weather predominated in many eastern districts, with some generous rains in the Atlantic coast States from North Carolina to Maine, but fair weather, as a rule, prevailed west of the Mississippi.

The precipitation for the month, as a whole, was fairly plentiful over most of the Florida Peninsula, New England, and eastern New York, the southern Appalachian district and over a strip extending from central Texas northward and northeastward to the upper Lake region. It was moderate for the season in northern Idaho, the western portions of Washington and Oregon, but was considerably below the normal in most of California. Over large portions of the country the rainfall was light, especially so in the middle Gulf region, southern Georgia, the interior of the Carolinas, the upper Mississippi Valley, and most of the Plains region. In Arizona and southeastern California there was practically no rain, and it was scanty in New Mexico, most of Utah and Nevada, and in southern Idaho.

RELATIVE HUMIDITY.

The month, as a whole, was generally drier than the average over the greater portion of the country, except in relatively small areas in the central portions of the Rocky Mountain and Plains States, and parts of the Lake region, New England, and the Middle and South Atlantic States, where the relative humidity was near or somewhat above the normal. However, at many stations scattered irregularly throughout the country, the mornings were damper and the evenings drier than the respective averages.

GENERAL SUMMARY.

The weather of November, 1916, was favorable in all sections of the country for outdoor work, except that in the Southern States and eastern Oregon dry weather prevented plowing and seeding, while in California the cold weather hindered farm operations.

Winter wheat was reported in good condition in most northern sections, but growth was delayed throughout much of the southern part of the country by lack of moisture. However, the rains during the latter part of the month were beneficial in the Southern States, and planting, previously delayed by dry weather, made good progress. The growth of most winter grain was retarded somewhat in the lower Mississippi Valley by the freeze of the middle of the month.

Except in South Carolina, cotton was practically all harvested, conditions for this work being favorable during most of the month. Cold weather damaged potatoes in Mississippi, Louisiana, Colorado, Washington, and Oregon, and apples in Colorado, Washington, and Oregon. It also severely injured truck in practically all Southern States, and sugar cane in the same region to some extent.

The weather was favorable for ripening citrus fruit in Arizona, but frost during the second decade of the month caused serious damage to the olives in California, and in some parts of the State to citrus fruit. Satsuma oranges were uninjured in Alabama, but were damaged in Mississippi by the cold wave of the middle of the month, and about 20 per cent of the citrus fruit in Texas was injured.

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Average accumulated departures for November, 1916.

Districts.	Temperature.			Precipitation.			Cloudiness.		Relative humidity.	
	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure for the current month.	Accumulated departure since Jan. 1.	General mean for the current month.	Departure from the normal.	General mean for the current month.	Departure from the normal.
	°F.	°F.	°F.	In.	In.	In.	0–10		Per ct.	
New England	39.1	−0.2	− 4.5	2.44	−1.0	− 4.80	5.6	−0.2	74	− 4
Middle Atlantic	45.9	+1.3	+ 7.6	1.74	−1.1	− 5.80	4.8	−0.5	70	− 5
South Atlantic	55.9	+1.8	+11.0	1.36	−1.6	−11.80	3.5	−1.0	74	− 4
Florida Peninsula	71.0	+0.4	− 1.4	2.73	+0.5	−12.60	4.6	+0.1	75	− 5
East Gulf	66.9	+1.3	+ 8.9	2.15	−1.4	− 2.60	3.1	−1.5	69	− 7
West Gulf	56.9	+0.5	+13.2	2.15	−1.0	− 6.80	3.2	−1.4	68	− 6
Ohio Valley and Tennessee	47.1	+2.5	+ 4.2	1.64	−1.8	− 2.40	3.7	−2.0	68	− 5
Lower Lakes	39.9	+0.8	+ 0.9	1.81	−1.2	− 3.30	6.2	−1.1	74	− 3
Upper Lakes	35.7	+1.7	+ 2.5	1.81	−0.6	+ 1.90	6.9	−0.2	78	− 2
North Dakota	29.2	+4.6	−13.0	0.18	−0.6	− 0.50	4.8	−0.6	75	− 4
Upper Mississippi Valley	40.9	+3.2	+ 6.2	1.60	−0.4	− 1.60	4.8	−0.5	72	− 2
Missouri Valley	40.9	+3.5	+10.9	1.38	+0.1	− 5.80	3.8	−1.0	68	− 3
Northern slope	30.4	−1.6	−15.0	0.59	−0.2	+ 0.20	4.6	−0.2	66	− 1
Middle slope	42.8	+1.1	+ 5.1	1.16	+0.2	− 3.90	3.0	−0.9	65	+ 3
Southern slope	49.7	−1.3	+14.1	0.48	−0.7	− 4.70	2.6	−2.6	59	− 8
Southern Plateau	47.2	−1.8	− 5.2	0.12	−0.5	+ 1.00	1.6	−1.2	43	0
Middle Plateau	35.2	−4.3	−10.1	0.32	−0.6	+ 0.60	2.9	−1.0	54	− 4
Northern Plateau	34.3	−4.4	−20.9	1.29	−0.1	+ 0.70	5.8	0.0	66	− 8
North Pacific	43.4	−2.1	− 9.8	5.90	−1.4	− 9.70	6.1	−1.4	80	− 4
Middle Pacific	50.2	−2.8	− 5.8	1.46	−1.7	− 1.80	3.6	−0.9	63	−12
South Pacific	55.4	−1.6	− 6.2	0.20	−1.1	+ 4.80	2.5	−0.8	64	− 3

WEATHER CONDITIONS ON THE NORTH ATLANTIC OCEAN DURING NOVEMBER, 1915.

The data presented are for November, 1915, and comparison and study of the same should be in connection with those appearing in the REVIEW for that month. Chart IX (XLIV–142) shows for November, 1915, the averages of pressure, temperature, and the prevailing direction of the wind at 7 a. m., 75th meridian time (Greenwich mean noon), together with the locations and courses of the more severe storms of the month.

PRESSURE.

The distribution of the average pressure for the month, as shown on Chart IX, presents some unusual features. There was only a trace of the usual North Atlantic or Azores HIGH, although a small area of high pressure, with a crest of 30.05 inches, existed near the position normally occupied by this center of action, with its normal crest of 30.15 inches. The continental HIGH, with a crest of 30.15 inches, was slightly south of its usual position, the isobar of 30.1 inches passing between the south coast of Florida and Cuba and extending as far east as the 69th meridian. There was a well-developed LOW, with average minimum pressure of 29.75 inches, near latitude 55° N., longitude 46° W., but it was considerably south and west of the usual position of the Icelandic LOW. There were indications of a second LOW in the vicinity of the Scandinavian Peninsula, although the center was apparently outside the limits of the chart.

The mean monthly pressure gradient between the higher and lower latitudes was somewhat less than usual, although in many localities the changes in barometric readings from day to day were abnormal. In the 5-degree square between latitudes 30°–35° and longitudes 25°–30° the lowest barometer reading during the month

was 29.67 inches on the 25th, and the highest 30.33 inches on the 9th.

Dividing the month into three decades, the average reading in this square for the first was 30.17 inches; for the second, 30.11 inches; and for the third, 29.86 inches, while the mean for the month was 30.05 inches, and the normal is 30.15 inches. In the 5-degree square near the coast of Ireland, or between latitudes 50°–55° N. and longitudes 10°–15° W., the lowest barometric reading was 28.89 inches on the 30th, and the highest 30.53 inches the 25th. The average pressure for the first decade was 29.27 inches; for the second, 29.86 inches; and the third, 30.03 inches, the monthly mean being 29.95 inches, and the normal 29.88 inches. In the region southeast of Greenland, between latitudes 55°–60°, longitudes 35°–40°, the lowest reading was 29.10 inches on the 27th, and the highest 30.44 inches on the 24th. The average for the first decade was 29.86 inches; the second, 29.45 inches; and the third, 29.98 inches; the monthly mean was 29.76 inches, and the normal is 29.68 inches. In the waters between the African coast and the Canary Islands the lowest reading was 29.60 inches on the 28th, and the highest 30.24 inches on the 15th. The average for the first decade was 29.95 inches; the second, 30.14 inches; and the third, 29.87 inches; the monthly mean was 29.99 inches, and the normal is 30.02 inches.

These figures are given to show the great irregularity in the distribution of pressure during the month and the differences that existed over separate parts of the ocean.

It may be noted that in the first 5-degree square mentioned the highest pressure occurred in the first decade of the month and the lowest in the last, while in the square adjacent to the west coast of Ireland the highest prevailed during the last 10 days and the lowest in the middle period of the month.

In the Caribbean Sea and Gulf of Mexico the pressure was comparatively uniform during the month, and the departures from the normal were also small.

GALES.

In the waters adjacent to the European coast the number of gales reported during the month was somewhat above the normal and the same conditions existed over the greater part of the ocean, although there were some exceptions. They were unusually numerous in the region between the 40th meridian and the American coast and the 35th and 50th parallels. The greatest number during the month occurred in the 5-degree square between latitudes 35°–40° N. and longitudes 65°–70° W., where they were reported on 11 days, a percentage of 37, while the normal for that square is 12 per cent. There were other localities where the positive departure was nearly as large, the month as a whole being unusual for its stormy character.

From November 1 to 3 two extensive areas of low pressure existed; one central near the Canadian coast and the other covering a large part of England and France. They were both, however, of comparatively light intensity and no specially heavy winds were reported from the vicinity of their centers. By the morning of the 4th the first LOW had moved about 5 degrees in a southerly direction, moderate winds prevailing. The second was central in Spain and several vessels in the vicinity of the Madeiras encountered gales of from 40 to 50 miles per hour; hail also was reported. On November 6 there was a well-developed LOW central about 12 degrees east of New York, and heavy northerly winds prevailed between its center and the American coast. On the 7th the conditions were about the same, while by the 8th the center was near latitude 40°, longitude 55°; the intensity of the wind remained about the same and fog was encountered in the northern quadrants of the storm area. On November 9 a well-defined LOW appeared central on the west coast of Scotland; the lowest barometric reading was 28.82 inches, while gales of over 50 miles an hour, accompanied by hail, were reported. This disturbance moved in a northeasterly direction, and on the 10th covered a large portion of the North Sea and a part of the Scandinavian Peninsula, but with little change of pressure. One vessel off the north coast of Scotland reported a gale of 75 miles an hour. On November 11 a LOW (I on Chart IX) was central near latitude 53°, longitude 23°; but while the barometer read as low as 28.71 inches there were no specially heavy winds reported in its vicinity. This storm moved in an easterly direction, reaching, on the 12th, a point about 100 miles south of the southern coast of Ireland. The barometer had fallen to 28.37 inches, and in the storm area, which extended as far west as the 22d meridian and between the 45th and 52d parallels, gales of from 40 to 75 miles per hour prevailed, one vessel reporting hail. This disturbance then moved southeastward, and on the 13th had reached the vicinity of Denmark; but the barometer had risen to 28.82 inches and the velocity of the wind diminished somewhat, although gales of from 40 to 50 miles per hour, accompanied by snow and hail, were still reported. On the 14th a LOW (II on Chart IX) of light intensity was central near Brownsville, Tex.; thence it moved rapidly in a northeasterly direction to the vicinity of near New York on the morning of the 15th; the barometer had fallen to 29.36 inches, but there were no winds of gale force recorded. This LOW continued on its northeasterly course and on the 16th was near Newfoundland. While the winds near the center of the storm were of moderate velocity, there was a large area between that point and the Bermudas, where gales of from 40 to 60 miles prevailed. This disturbance remained nearly stationary during the next 24 hours, on the 17th the center being only slightly north of its position on the previous day and the conditions of wind and weather had changed but little. It then moved rapidly due eastward and on the 18th the approximate center was at latitude 53° N., longitude 40° W., although it is impossible to locate its position accurately, as no reports were received for this day from points north of latitude 51° and west of 30° W. Unusually stormy conditions continued over a large territory west of the 40th meridian and north of the 35th parallel, while snow and hail were reported from a number of vessels. The storm continued eastward but with a lessened rate of translation, and on the 19th its center was near latitude 51° N., longitude 34° W. The minimum barometer reading still remained below 29 inches, and while the storm area was much less extensive than on the day before a number of vessels between 40°–46° N. and 40°–48° W. reported northwesterly gales of from 40 to 75 miles, accompanied by hail and snow. Traces of this LOW could be seen on the 20th, but it had increased in area and was rapidly filling in, although gales of diminished force were still encountered in the southeast quadrant.

On November 21 and 22, 1915, a LOW of moderate intensity covered a large part of eastern Canada and the Gulf of St. Lawrence. On the 23d the center of this disturbance was about 4 degrees east of Saint Johns, N. F., with moderate winds, and fog prevailing for the most part, and hail was reported from one vessel.

On November 24 a LOW (III on Chart IX) was central near latitude 37°, longitude 66°; the lowest barometric reading was 29.78 inches, and moderate gales were re-

ported from a small area near the center. By the 25th this disturbance had moved in an easterly direction to a point near latitude 38°, longitude 58°; the barometer had fallen to 29.56 inches, and heavy gales prevailed over a large territory between 30°—45° N. and 55°—70° W. There was a slight northeastward movement of this disturbance during the next 24 hours, and on the 26th it was central near latitude 40°, longitude 58°. North of the center the winds were moderate and the weather foggy, while west of that point gales of from 40 to 50 miles an hour prevailed to the 70th meridian. This LOW then curved sharply toward the south, having increased in extent and decreased in intensity, and on the 27th the center was near latitude 37°, longitude 57°, with winds of moderate force. The disturbance then moved northward, and on the 28th was central near latitude 40°, longitude 55°, with little change in pressure and conditions of wind and weather. Its rapid eastward movement brought its center, on the 29th, near latitude 42°, longitude 47°, where the conditions were nearly the same as on the previous day.

On November 27 a LOW (IV on Chart IX) apparently existed in the vicinity of southern Iceland, although it is impossible to determine its position accurately on account of lack of observations. This LOW moved rapidly in a due southerly direction, and on the 28th was central near latitude 56°, longitude 22°; the lowest barometer reading was 28.97 inches, and strong westerly and northwesterly gales, accompanied by hail, were reported from the southwest quadrant. The disturbance then moved slowly toward the east, and on the 29th was apparently central near latitude 55°, longitude 17°; the intensity remained about the same as on the day before, and there was little change in wind and weather, as strong gales still prevailed over the steamer lanes between the 20th and 32d meridians. The depression continued its slow easterly movement, and on the 30th the center was near latitude 55°, longitude 16°, while westerly and northwesterly gales of from 40 to 70 miles an hour continued to rage in the southern and southwestern quadrants. It then changed its course slightly toward the south, and on December 1 was central in southern Ireland; the barometer had risen somewhat since the day before and the force of the wind diminished, although moderate gales of from 40 to 50 miles were reported from a limited area off the French coast.

TEMPERATURE.

The temperature of the air over the ocean was, as a rule, considerably above the normal. In the waters adjacent to the European coast the departures ranged from 0 to +2 degrees, while along the northern steamer routes there was a gradual increase of temperature from the East toward the West, and positive departures of from +10 to +12 degrees existed in some of the 5-degree squares north of the 45th parallel and west of the 45th meridian. South of the 45th parallel the departures were comparatively uniform, ranging from 0 to +3 degrees, except in the Gulf of Mexico, where the positive departures were considerably larger than at the adjacent land stations.

The temperature departures at a number of Canadian and U. S. Weather Bureau stations on the Atlantic and Gulf coasts were as follows:

	°F.		°F.
St. Johns, Newfoundland	+3.9	Norfolk, Va.	+1.2
Sydney, C. B. I.	+4.3	Hatteras, N. C.	+0.6
Halifax, N. S.	+5.0	Charleston, S. C.	+3.3
Eastport, Me.	+1.7	Key West, Fla.	+1.2
Portland, Me.	+3.2	Tampa, Fla.	+3.9
Boston, Mass.	+4.2	Pensacola, Fla.	+3.5
Nantucket, Mass.	+0.6	New Orleans, La.	+5.6
Block Island, R. I.	+0.5	Galveston, Tex.	+4.1
New York, N. Y.	+1.4	Corpus Christi, Tex.	+4.6
Washington, D. C.	+1.2		

The lowest temperature recorded during the month was 32°F. on the 18th, in the 5-degree square between the 55th and 60th parallels and the 40th and 45th meridians, while the highest for the same square was 48°, occurring on four days during the first decade of the month.

FOG.

During the period from 1901 to 1906 for the month of November the average percentage of days with fog off the banks of Newfoundland was from 30 to 35, while for November, 1915, in the same region, it was observed on 12 days, a percentage of 40. In the vicinity of Cape Cod and Nantucket the amount was also considerably above the normal, while along the North Atlantic steamer routes, east of the 30th meridian, there was less fog than usual.

PRECIPITATION.

Hail was observed on 9 days during the month, north of the 40th parallel; also on the 8th and 14th, in the region between the 30th and 35th parallels, and the 50th and 60th meridians. Snow was reported on the 11th and 13th between Iceland and the Scandinavian Peninsula, and on the 17th and 19th between the 40th and 45th parallels and the 45th and 55th meridians.

Maximum wind velocities during November, 1916.

[Velocities below 50 mis./hour (22.4 m./sec.) are not included.]

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Mis./hr.				*Mis./hr.*	
Block Island, R. I.	24	54	w.	North Head, Wash.	1	58	se.
Buffalo, N. Y.	10	63	sw.	Do.	2	66	s.
Do.	23	66	sw.	Do.	3	70	se.
Do.	24	72	w.	Do.	4	60	se.
Canton, N. Y.	24	56	w.	Do.	5	50	se.
Cheyenne, Wyo.	5	68	w.	Do.	21	60	se.
Do.	9	58	w.	Do.	24	54	s.
Do.	28	54	w.	Do.	26	76	se.
Cleveland, Ohio	24	54	w.	Do.	27	78	se.
Duluth, Minn.	23	52	w.	Do.	29	62	s.
Eastport, Me.	11	50	w.	Point Reyes Light, Cal.	6	54	nw.
Do.	24	54	s.	Do.	18	54	nw.
Erie, Pa.	23	55	sw.	Portland, Me.	11	61	nw.
Grand Haven, Mich.	24	53	w.	Do.	24	60	se.
Grand Junction, Colo.	5	56	w.	Do.	25	55	sw.
Key West, Fla.	15	52	n.	St. Louis, Mo.	8	58	s.
Lexington, Ky.	23	50	sw.	St. Paul, Minn.	6	56	s.
Louisville, Ky.	23	52	sw.	Do.	23	50	nw.
Modena, Utah	5	51	s.	Salt Lake City, Utah	5	50	sw.
Mount Tamalpais, Cal.	5	57	sw.	Sand Key, Fla.	15	71	n.
Do.	6	58	nw.	Sandy Hook, N. Y.	23	57	sw.
Do.	13	58	nw.	Seattle, Wash.	27	52	w.
Do.	18	53	nw.	Tatoosh Island, Wash.	2	68	s.
Do.	19	60	n.	Do.	27	56	w.
New York, N. Y.	23	62	s.	Do.	29	68	s.
Do.	24	66	nw.	Wichita, Kans.	26	51	s.